NATIONAL GUIDELINE CLEARINGHOUSE™ (NGC™) GUIDELINE SYNTHESIS

PHARYNGITIS/SORE THROAT

Guidelines

1. Infectious Diseases Society of America (IDSA). Practice guidelines for the diagnosis and management of group A streptococcal pharyngitis. Clin Infect Dis 2002 Jul 15;35(2):113-25 [96 references]
2. University of Michigan Health System (UMHS). Pharyngitis. Ann Arbor (MI): University of Michigan Health System; 2000 Dec. 8 p. [8 references]
3. Scottish Intercollegiate Guidelines Network (SIGN). Management of sore throat and indications for tonsillectomy. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 1999 Jan. 23 p. (SIGN publication; no. 34). [74 references]
4. American College of Physicians (ACP). Principles of appropriate antibiotic use for acute pharyngitis in adults. Ann Intern Med 2001 Mar 20;134(6):506-8 [1 reference]

INTRODUCTION:

Guidelines issued by IDSA, UMHS, SIGN, and ACP for managing patients with acute pharyngitis (sore throat) in the outpatient setting are compared in the following table. The comparison is restricted to recommendations for uncomplicated cases of acute pharyngitis and does not include recommendations for high-risk patients, patients with severe symptoms such as respiratory distress, or other complicating factors. Local complications of group A beta-hemolytic streptococcal (GABHS) pharyngitis include peritonsillar abscess (quinsy) or retropharyngeal abscess. High-risk patients are those with a personal history or family member with a history of acute rheumatic fever, specifically, those who have had rheumatic carditis or valvular disease. Additional recommendations addressing these patient populations may be found in the individual guidelines.

The evidence supporting the major recommendations is also identified, with the definitions of the rating schemes used by IDSA, UMHS, and SIGN included in the last row of the table.

Abbreviations used in the text and tables follow:

- ACP, American College of Physicians
- ARF, acute rheumatic fever
- GABHS, group A beta-hemolytic streptococcal
- IDSA, Infectious Diseases Society of America
- RADT, rapid antigen detection test

- RST, rapid strep test
- SIGN, Scottish Intercollegiate Guidelines Network
- UMHS, University of Michigan Health System

OBJECTIVE AND SCOPE	
IDSA (2002)	• To provide recommendations for the accurate diagnosis and optimal treatment of group A streptococcal pharyngitis • To update the 1997 guideline issued by IDSA on diagnosis and management of group A streptococcal pharyngitis (Clin Infect Dis 1997 Sep;17(3):574-83.)
UMHS (2000)	• To utilize symptoms and signs to determine pretest probability of GABHS disease • To confirm negative result with culture when strep is suspected and a rapid strep screen is performed • To reduce indiscriminate use of expensive antibiotics • To assure adequate courses of antibiotic treatment • To decrease the occurrence of ARF
SIGN (1999)	• To suggest a rational approach to the management of acute sore throat in general practice • To provide reasonable criteria for referral for tonsillectomy Note: The guideline considers only tonsillectomy for recurring sore throat. It does not address tonsillectomy for suspected malignancy or as a treatment for sleep apnea, peritonsillar abscess, or other conditions.
ACP (2001)	• To provide recommendations on appropriate antibiotic use for acute pharyngitis in adults
TARGET POPULATION	
IDSA (2002)	• United States • Pediatric, adolescent, and adult outpatients with a complaint of sore throat
UMHS (2000)	• United States • Adults, adolescents and children with sore throat
SIGN (1999)	• United Kingdom • Patients of all ages presenting with sore throat.
ACP (2001)	• United States • Adults (> 18 years of age) with acute pharyngitis

INTERVENTIONS AND PRACTICES CONSIDERED	
IDSA (2002)	Diagnosis • Consideration of clinical and epidemiologic features to estimate probability of GABHS infection • Laboratory confirmation of possible GABHS pharyngitis: throat culture, rapid antigen detection test [RADT, also known as rapid strep test (RST), rapid strep screen, or rapid antigen screen] Treatment • Symptomatic treatment if diagnosis is confidently excluded on clinical and epidemiological ground or GABHS is ruled out on the basis of laboratory tests • Antimicrobial therapy for laboratory confirmed cases of GABHS • First line: Oral penicillin V or intramuscular benzathine penicillin G; Amoxicillin for young children; Erythromycin for penicillin-allergic patients • Alternative: First or second generation cephalosporins Management • Management of patients with repeated episodes of acute pharyngitis and cultures or RADTs positive for GABHS
UMHS (2000)	Diagnosis • Scoring system for symptoms and signs to determine pretest probability of GABHS • Laboratory confirmation of intermediate or possibly high probability cases: throat culture, Group A strep antigen screen (rapid strep screen) Treatment • Symptomatic treatment for low probability cases and those with negative laboratory results • Antimicrobial therapy for laboratory confirmed cases or for high probability cases of GABHS Preferred: Oral penicillin V, intramuscular benzathine penicillin G, or amoxicillin for adolescents and adults; amoxicillin for children; Erythromycin, in penicillin-allergic patients. Alternative: Augmentin, azithromycin, cefixime, cefuroxime, cephalexin, or clindamycin for adolescents and adults; cefixime, cefuroxime, cephalexin, clindamycin, cefprozil, or cefadroxil for children. Consultation • Consultation with otolaryngology for peritonsillar abscess (quinsy) or

	retropharyngeal abscess
SIGN (1999)	Diagnosis • Clinical diagnosis • Laboratory tests: throat culture, rapid antigen testing Treatment • Management of acute sore throat including simple analgesics (aspirin), non-steroidal anti-inflammatory agents, and other analgesics (paracetamol with codeine) • Antibiotics under special circumstances only, for example, severe cases where the practitioner is concerned about the clinical condition of the patient. Penicillin V is the most commonly used antibiotic Referral • Indications for tonsillectomy for recurring sore throat including referral criteria and otolaryngological assessment
ACP (2001)	Diagnosis • No recommendations offered Treatment • Symptomatic treatment (analgesics, antipyretics, supportive care) • Antibiotic therapy depending on the likelihood of GABHS: Penicillin; Erythromycin
DIAGNOSIS	
Clinical Presentation	
IDSA (2002)	The signs and symptoms of group A streptococcal and other pharyngitides (most frequently viral) overlap broadly. The diagnosis of acute group A streptococcal pharyngitis should be suspected on clinical and epidemiological grounds. Epidemiological features suggestive of GABHS include: • Children between 5 and 15 years of age. • Seasonal occurrence (winter, early spring) in temperate climates. • Recent close contact with a documented case of streptococcal pharyngitis.

	• Known high prevalence of GABHS infections in the community. Suggestive clinical findings include: • Sudden onset sore throat. • Severe pain on swallowing. • Fever. Headache, nausea, vomiting and abdominal pain may also be present, especially in children. On examination, patients have tonsillopharyngeal erythema with or without exudates and tender enlarged anterior cervical lymph nodes (lymphadenitis). Other findings may include a beefy, red, swollen uvula; petechiae on the palate; excoriated nares (especially in infants); and a scarlatiniform rash. However, none of these clinical findings is specific for GABHS pharyngitis. Conversely, the absence of fever or the presence of clinical features such as conjunctivitis, cough, hoarseness, coryza, anterior stomatitis, discrete ulcerative lesions, viral exanthem, an diarrhea strongly suggest a viral rather than a streptococcal etiology.
UMHS (2000)	Symptoms/signs can indicate the probability of GABHS, with the probability more accurate for adults than for children. • Adults: a limited set of symptoms and signs can identify a low, intermediate, or high probability of having GABHS pharyngitis. [evidence: C]. • Children: a limited set of symptoms, signs and epidemiologic criteria can identify a high probability of having GABHS pharyngitis. [evidence: C]. In adults the three findings of fever, tender anterior nodes and swollen exudative tonsils have been demonstrated to have a positive correlation with GABHS. Two symptoms, cough and post nasal drainage, lower the pretest probability of GABHS pharyngitis. Recommended scoring system: For Adults: Suggestive for GABHS (score +1 for each): • $\leq$ 3 days of fever > 39 degrees C (101.5 degrees F) • Tender anterior cervical nodes. • Enlarged tonsils with purulent exudates. Suggestive against GABHS (score -1 each): • Postnasal drainage. • Cough. Probability scores:

	• Low (score = -1, -2) • Intermediate (score = 0, 1, 2) • High (score = 3) For children: In children, 1) fever of at least 38.3 in the past 24 hours, 2) age between 5-15 years, 3) tender anterior cervical nodes, 4) erythema, swelling or exudates on tonsils or pharynx, and 5) occurrence between November and May, 6) all in the absence of conjunctivitis, cough or rhinorrhea, predicts a positive culture in 75%. Even with 5 of the 6 above criteria present, a positive culture can be predicted in 59%. All other combinations carry a positive predictive value of less than 50%.
SIGN (1999)	Clinical examination should not be relied upon to differentiate between viral and bacterial sore throat (evidence level: IIb - grade of recommendation: B). Precise clinical diagnosis is difficult in practice. The clinical picture in an individual sore throat is of limited assistance in distinguishing between a bacterial and a viral etiology Studies for sensitivity and specificity suggest that reliance on clinical diagnosis will miss 25-50% of GABHS pharyngitis cases and that 20-40% of those with negative throat cultures will be labeled as having GABHS.
ACP (2001)	No recommendations offered
Clinical Scoring Systems	
IDSA (2002)	Not recommended. Efforts have been made to incorporate the clinical and epidemiological features of acute pharyngitis into scoring systems that attempt to predict the probability that a particular illness is caused by GABHS. These clinical scoring systems are helpful in identifying patients who are at such low risk of streptococcal infection that performance of a throat culture or an RADT is usually unnecessary. However, the signs and symptoms of streptococcal and nonstreptococcal pharyngitis overlap too broadly for diagnosis to be made with the requisite diagnostic precision on clinical grounds alone. The clinical diagnosis of GABHS pharyngitis cannot be made with certainty even by the most experienced physicians, and bacteriologic confirmation is required (category A, grade II).
UMHS (2000)	Recommended for adults (see above). Although the diagnostic impression cannot be used to accurately identify all cases of GABHS, higher symptom scores correlate with higher pretest probabilities of GABHS pharyngitis. The high probability group of adults (symptom score of 3) has a pretest probability of GABHS of about 28%-67%. They comprise approximately 10%-15% of the adult

	pharyngitis population. The low probability adult group (symptom scores of -1 or -2) have a pretest probability of 2.5%-4%. They comprise approximately 30% of the adult pharyngitis population. The above probabilities vary with the prevalence of GABHS, which can vary across seasons, between communities, and between sites within a community.
SIGN (1999)	Not recommended. Clinical scoring systems to predict the etiology of sore throat based on symptom complexes such as tonsillar exudate, anterior cervical lymphadenectomy, absence of cough, pharyngeal erythema, level of pyrexia and pain are not reliable. Results from predictive studies are conflicting and inconclusive.
ACP (2001)	No recommendations offered
Laboratory Confirmation of Diagnosis - Who should be tested?	
IDSA (2002)	The diagnosis of acute group A streptococcal pharyngitis should be suspected on clinical and epidemiological grounds and then supported by performance of a laboratory test. A positive result of either throat culture or RADT provides adequate confirmation of the presence of GABHS in the pharynx. However, for children and adolescents, a negative RADT result should be confirmed with a throat culture result, unless the physician has ascertained in his or her own practice that the RADT used is comparable to a throat culture. Because of the epidemiological features of acute pharyngitis in adults (e.g., low incidence of streptococcal infection and extremely low risk of rheumatic fever), diagnosis of this infection in adults on the basis of the results of an RADT, without confirmation of negative RADT results by negative results of culture, is an acceptable alternative to diagnosis on the basis of throat culture results. The generally high specificity of RADTs should minimize overprescription of antimicrobials for treatment of adults. (category A, grade II). Selective use of diagnostic studies is recommended. Testing usually need not be done for patients with acute pharyngitis that have clinical and epidemiological features not suggestive of a group A streptococcal etiology.
UMHS (2000)	Laboratory confirmation is most useful when GABHS is suspected but not highly probable. • Adults: test those with intermediate probability. [evidence: C] • Children: test all cases where symptoms are uncertain or suggest GABHS, since the probability level is less certain. Testing is not recommended for adults with low probability of GABHS. Testing is not recommended for adults with high probability of GABHS unless there are special reasons to test such as to document the index case to treat close contacts more rapidly or if standard therapy has failed.

	Testing is not recommended for children with symptoms that suggest against GABHS.
SIGN (1999)	Throat swabs are neither sensitive nor specific for serologically confirmed infection, considerably increase costs, may medicalise illness and alter few management decisions. Throat swabs or rapid antigen testing should not be carried out routinely in sore throat (evidence level: III - grade of recommendation: B).
ACP (2001)	No recommendations offered
Laboratory utilization - Which test, a rapid strep test [RST; rapid antigen detection test (RADT); rapid strep screen] or throat culture, should be ordered initially?	
IDSA (2002)	Either throat culture or RADT can be used to confirm the diagnosis of GABHS. A positive result of either throat culture or RADT provides adequate confirmation of the presence of group A beta-hemolytic streptococci in the pharynx. For children and adolescents, a negative RADT result should be confirmed with conventional blood agar plate culture results, unless the physician has ascertained in his or her own practice that the RADT used is comparable to a throat culture (category A, grade II). Because of the epidemiological features of acute pharyngitis in adults (e.g., low incidence of streptococcal infection and extremely low risk of rheumatic fever), diagnosis of this infection in adults on the basis of the results of an RADT, without confirmation of negative RADT results by negative results of culture, is an acceptable alternative to diagnosis on the basis of throat culture results (category A, grade II). Throat Culture. Culture of a throat swab on a sheep-blood agar plate remains the standard for the documentation of the presence of group A streptococci in the upper respiratory tract and for the confirmation of the clinical diagnosis of acute streptococca pharyngitis (category A grade II). If done correctly, culture of a single throat swab on a blood agar plate has a sensitivity of 90% to 95% for the detection of the presence of group A beta-hemolytic streptococci in the pharynx (category A grade II). RADT. A disadvantage of culturing a throat swab on blood agar plates is the delay (overnight or longer) in obtaining the result. RADTs have been developed for the identification of group A beta-hemolytic streptococci directly from throat swabs. Although these rapid tests are more expensive than blood agar culture, they provide results faster. Rapid identification and treatment of patients with streptococcal pharyngitis can reduce the risk of the spread of group A beta-hemolytic streptococci, allowing the patient to return to school or work sooner, and can reduce the acute morbidity associated with the illness (category A, grade II). The use of RADTs for certain populations (e.g., patients seen in emergency departments) has been shown to significantly increase the number of patients appropriately treated for streptococcal pharyngitis, compared with use of traditional throat cultures. The great majority of the RADTs that are currently available have an excellent

	specificity of 95%, compared with blood agar plate culture (category A, grade II). This means that false-positive test results are unusual, and, therefore, therapeutic decision can be made with confidence on the basis of a positive test result. Unfortunately, the sensitivity of most of these tests is 80%90%, or even lower, compared with blood aga plate culture (category A, grade II).
UMHS (2000)	Throat culture is the "gold standard" for diagnosis [evidence: C]. Strep screens identify GABHS more rapidly, but are somewhat less sensitive [evidence: C]. Reserve rapid tests for patients with high probability of having GABHS, culture alone in all others will be most cost effective. In patients where GABHS is suspected and tested with a streptococcal antigen screen, a negative result should be confirmed by culture. [evidence: C] When a clinician has decided to order a laboratory test to diagnose GABHS, the choice between starting with an antigen screen or simply obtaining a culture should consider the benefits and costs in the context of the individual patient. Early positive diagnosis and initiation of therapy with the use of the RADT may reduce the period of infectivity and morbidity and may allow the patient to return to normal activity sooner. However, the value of early diagnosis in the minority of cases when strep is present and identified must be weighed against the higher total laboratory charges for the majority of cases screened. Most screens are negative and additional charges will be incurred for a subsequent culture.
SIGN (1999)	Not applicable: Routine laboratory testing with either throat swabs or rapid antigen testing is not recommended because of poor specificity and sensitivity (evidence level: III - grade of recommendation: B). Throat swabs are neither sensitive nor specific for serologically confirmed infection because of the relatively high incidence of GABHS carriers. Using throat swab culture as a gold standard to evaluate the performance of RADT is questionable when compared with antistreptolysin O (ASO) titre, which is not in itself clinically useful in managing acute sore throats.
ACP (2001)	No recommendations offered
TREATMENT	
Treatment Decisions: • Who should be treated? • When should antibiotics be used?	
IDSA (2002)	Antimicrobial therapy is indicated for persons with symptomatic pharyngitis if the presence of an organism in the throat is confirmed by culture or RADT. If there is clinical or epidemiological evidence that results in a high index of suspicion, antimicrobial therapy can be initiated while the physician is waiting for laboratory

	confirmation, provided that the therapy is discontinued if the diagnosis of streptococca pharyngitis is not confirmed by the results of the laboratory test.
UMHS (2000)	Treatment decisions are based on probability of GABHS and results of laboratory testing. In adults with low probability of GABHS, symptomatic treatment is recommended. In adults with intermediate probability of GABHS, treatment decisions are based on results of laboratory testing. If GABHS is confirmed, antibiotic treatment is recommended. If GABHS is ruled out based on culture results, symptomatic treatment is recommended. In adults with high probability GABHS pharyngitis, antibiotic treatment is recommended without laboratory confirmation, or based on laboratory results in special cases. In children with symptoms that are unlikely to be due to GABHS pharyngitis, symptomatic treatment is recommended. In children with uncertain symptoms or symptoms suspicious for GABHS pharyngitis, treatment decisions are based on results of laboratory testing. If GABHS is confirmed with RADT or culture results, antibiotic treatment is recommended. If GABHS is ruled out based on culture results, symptomatic treatment is recommended.
SIGN (1999)	Diagnosis of sore throat does not mean that an antibiotic has to be administered. Adequate analgesia will usually be all that is required. There is insufficient evidence to support a recommendation on the routine use of antibiotics in acute sore throat. Antibiotics should NOT be used: • For symptomatic relief (evidence level: Ib - grade of recommendation: A). • Specifically to prevent the development of rheumatic fever or acute glomerulonephritis (evidence level III - grade of recommendation: B). • Routinely to prevent cross infection in the general population (evidence level III - grade of recommendation: B). • Specifically to prevent suppurative complications (grade of recommendation: C).
ACP (2001)	All patients with pharyngitis should be offered appropriate doses of analgesics, antipyretics, and other supportive care. Physicians should limit antimicrobial prescriptions to patients who are most likely to have GABHS. To determine who are the most likely the following strategies are suggested: a.) Empirical antibiotic treatment of adults with at least three of four

	clinical criteria (history of fever, tonsillar exudates, tender anterior cervical lymphadenopathy, and absence of cough) and non-treatment of all others. b.) Empirical treatment of adults with all four clinical criteria, rapid antigen testing of patients with three (or perhaps two) clinical criteria, and treatment of those with positive test results and non treatment of all others.
Antibiotic Selection and Duration	
IDSA (2002)	• Patients with acute streptococcal pharyngitis should receive therapy with an antimicrobial agent in a dosage and for a duration that is likely to eradicate the infecting organism from the pharynx. • On the basis of penicillin's narrow spectrum of antimicrobial activity, the infrequency with which it produces adverse reactions, and its modest cost, it is the drug of choice for non-allergic patients. A 10-day course of penicillin is recommended. Intramuscular benzathine penicillin G is preferred for patients who are unlikely to complete a full 10-day course of oral therapy. • Amoxicillin is often used in place of penicillin V as oral therapy for young children; the efficacy appears to be equal. This choice is primarily related to acceptance of the taste of the suspension. • Erythromycin is a suitable alternative for patients who are allergic to penicillin. First- or second-generation cephalosporins are also acceptable for treating patient allergic to penicillin who do not manifest immediate-type hypersensitivity to beta-lactam antibiotics. • For the rare patient infected with an erythromycin-resistant strain of group A Streptococcus who is unable to tolerate beta-lactam antibiotics, clindamycin is an appropriate alternative.
UMHS (2000)	• Penicillin or amoxicillin are the drugs of choice in adults; amoxicillin is the drug of choice for children; erythromycin for patients allergic to penicillin. [evidence: C]. Benzathine penicillin G is recommended for adults or children if compliance is in doubt. • Antibiotic treatment must be carried out for an entire 10-day period for penicillin. [evidence: D], amoxicillin may be given for 6 days in adults [evidence: A] • Alternative treatment regimens for children include cefixime, cefuroxime, cephalexin, clindamycin, and cefprozil, and cefadroxil; for adolescents and adults, Augmentin, azithromycin, cefixime, cefuroxime, cephalexin, and clindamycin.
SIGN (1999)	The limited information available is insufficient to support a recommendation on the routine use of antibiotics in acute sore throat. • In severe cases, where the practitioner is concerned about the clinical condition of the patient, antibiotics should not be withheld. Penicillin V 500 mg, four times daily for 10 days is the dosage used in the majority of studies. (Good Practice Point, based on the clinical experience of the guideline development group). • Practitioners should be aware that infectious mononucleosis may present with

	severe sore throat with exudate and anterior cervical lymphadenopathy and should avoid prescription of ampicillin based antibiotics, including co-amoxiclav, as first line treatment. (Good Practice Point, based on the clinical experience of the guideline development group).
ACP (2001)	The preferred antimicrobial agent for treatment of acute GABHS pharyngitis is penicillin, or erythromycin in penicillin-allergic patients. No recommendations are offered for length of antibiotic therapy.
Benefits of Antibiotics for GABHS	
IDSA (2002)	• Prevention of acute rheumatic fever. • Prevention of suppurative complications. • Improvement of clinical symptoms and signs. • Reduction in transmission of GABHS to close contacts.
UMHS (2000)	• Prevention of acute rheumatic fever. • Duration of illness: Early treatment of GABHS can decrease the time a patient is symptomatic by 1/2 - 2 days from a typical 3 - 7 days [evidence: A] and may decrease the period of contagiousness [evidence: C].
SIGN (1999)	• Benefits are limited and may be outweighed by the risks, such as allergy or anaphylaxis.
ACP (2001)	• Provide symptom relief by decreasing the duration of some symptoms by 1 to 2 days. • Decrease the risk for already rare complications (acute rheumatic fever, acute glomerulonephritis), and suppurative complications, such as peritonsillar abscess • Decrease spread of disease in areas of overcrowding or close contact, especially if small children may be exposed
EVIDENCE RATING SCHEMES	
Rating Scheme	
IDSA (2002)	Strength of recommendation: A. Good evidence to support a recommendation for use. B. Moderate evidence to support a recommendation for use. C. Poor evidence to support a recommendation for or against use.

	D. Moderate evidence to support a recommendation against use. E. Good evidence to support a recommendation against use. Quality of evidence I. Evidence from at least one properly randomized, controlled trial. II. Evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytic studies (preferably from more than one center), or from multiple time-series studies or dramatic results from uncontrolled experiments. III. Evidence from opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees.
UMHS (2000)	Levels of evidence: A. Randomized controlled trials. B. Controlled trials, no randomization. C. Observational trials. D. Opinion of expert panel.
SIGN (1999)	Grades of recommendation: A. Requires at least one randomized controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation. (Evidence levels Ia, Ib) B. Requires the availability of well conducted clinical studies but no randomized clinical trials on the topic of recommendation. (Evidence levels IIa, IIb, III) C. Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates an absence of directly applicable clinical studies of good quality. (Evidence level IV) Statements of evidence Ia. Evidence obtained from meta-analysis of randomized controlled trials. Ib. Evidence obtained from at least one randomized controlled trial. IIa. Evidence obtained from at least one well-designed controlled study without randomization. IIb. Evidence obtained from at least one other type of well-designed quasi-

	experimental study. III. Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies. IV. Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.

GUIDELINE CONTENT COMPARISON

The Infectious Diseases Society of America (IDSA), the University of Michigan Health Systems (UMHS), the Scottish Intercollegiate Guidelines Network (SIGN), and the American College of Physicians (ACP) present recommendations for managing acute pharyngitis in adults in the primary care setting. IDSA, UMHS, and SIGN also address the pediatric population and include diagnostic testing recommendations. IDSA, UMHS, and SIGN provide explicit reasoning behind their judgments, rating the evidence upon which recommendations are based. Although ACP does not offer an evidence-rating scheme, their guideline is accompanied by a background paper, part 2 of the clinical practice guideline, that supports their management recommendations [Cooper RJ, Hoffman JR, Bartlett JG, Besser RE, Gonzales R, Hickner JM, Sande MA. Principles of appropriate antibiotic use for acute pharyngitis in adults: background. Ann Intern Med 2001 Mar 20;134(6):509-17].

SIGN also issues recommendations regarding tonsillectomy for recurrent sore throat in children and adults. IDSA briefly addresses surgical treatment for recurrent pharyngitis. UMHS and ACP however, do not discuss indications for elective tonsillectomy. IDSA contains more detailed information regarding variables affecting throat culture and laboratory results than the other organizations. IDSA also details recommendations for repeated diagnostic testing and management of patients with repeated episodes of acute pharyngitis and positive laboratory tests for GABHS. To aid implementation and evaluation of their respective guidelines, IDSA describes indicators of quality care, and SIGN lists key points for audit. UMHS also presents their recommendations for managing adult and pediatric pharyngitis in detailed algorithms, facilitating their use by clinicians. SIGN and UMHS provide information regarding patient education on sore throat and associated treatments.

Areas of Agreement

UMHS, IDSA, and ACP each recommend antibiotic treatment of GABHS pharyngitis, to prevent acute rheumatic fever and to shorten the duration of signs and symptoms. Similar features of the diagnostic testing strategies proposed by UMHS and IDSA include selective use of laboratory tests (RADT and throat culture) for patients suspected of having GABHS pharyngitis. Management strategies for pharyngitis presented by ACP, IDSA, and UMHS share a common goal of refraining from antibiotic treatment if GABHS infection is an unlikely cause.

ACP and IDSA agree the antibiotic of choice to treat GABHS pharyngitis in non-allergic adults is penicillin, with most groups citing its proven efficacy in eradicating the organism from the oropharynx, safety profile, low cost, and narrow spectrum. UMHS recommends either penicillin or amoxicillin as antibiotics of choice to treat GABHS pharyngitis in non-allergic adults, citing a French trial of amoxicillin which found clinical and microbiological outcomes equivalent to penicillin.

Pediatric recommendations are provided by UMHS and IDSA. UMHS' recommendations for children are similar to IDSA's recommendations for all ages, in that patients are classified into two general categories according to whether they have symptoms consistent with GABHS pharyngitis or suggesting against GABHS pharyngitis. Unless the diagnosis of GABHS can be confidently excluded on the basis of clinical and/or epidemiological grounds, UMHS and IDSA recommend laboratory testing to ensure appropriate treatment of children. Both groups advise that negative results obtained with rapid strep tests require confirmation with throat culture, due to the lower sensitivity of the screening test. In their most recent guideline update, however, IDSA, has modified their 1997 guideline in the acceptance of negative results of rapid strep tests under certain circumstances (if the physician is certain that the sensitivity of the rapid strep test used is comparable to that of a throat culture and for diagnosis of streptococcal infection in adults).

Areas of Differences

Perspective on Acute Rheumatic Fever

The most dramatic difference among these recommendations reflects the nationality of the organizations: IDSA, UMHS, and ACP represent perspectives from the United States; SIGN, a Scottish viewpoint. According to two of the American organizations, IDSA and UMHS, the primary importance of diagnosing and treating GABHS pharyngitis is to prevent acute rheumatic fever in children and adults. ACP also acknowledges that antibiotic treatment of GABHS leads to a decreased risk for already rare complications in adults. Two of the three American organizations present diagnostic strategies for laboratory testing while all three provide recommendations for antibiotic treatment of GABHS pharyngitis. (See Diagnostic Strategies and Treatment Decisions below.)

SIGN, on the other hand, does not recommend laboratory testing or antibiotic treatment for sore throat.

SIGN questions the clinical utility of throat culture to diagnose GABHS pharyngitis, concluding throat swabs are neither sensitive nor specific for serologically confirmed infection, considerably increase costs, and alter few management decisions. Furthermore, SIGN rejects the clinical rationale to treat GABHS pharyngitis in order to prevent acute rheumatic fever based on epidemiological differences between the United States and the United Kingdom. They acknowledge that outbreaks of rheumatic fever are still reported in both children and adults in the United States. However, they point out that the incidence of rheumatic fever in the UK is extremely low. SIGN concludes there is no support in the literature for the routine treatment of sore throat with penicillin to prevent the development of rheumatic fever.

Diagnostic Strategies and Treatment Decisions

Recommendations for diagnostic strategies and treatment decisions are provided by IDSA and UMHS; ACP provides treatment recommendations only.

Diagnostic Strategies

UMHS recommends stratifying adults according to the prior probability of disease by using a simple clinical scoring system. Laboratory testing and antibiotic treatment decisions for adults are guided by these probability estimates: high probability patients should be immediately treated without undergoing laboratory testing, intermediate probability patients should be tested and treated according to laboratory results, low probability patients should not be tested or treated. UMHS identifies the advantages of this scheme:

- If all high probability adults are not tested, but immediately treated, about 1-5% of the population would be over-treated; however, expensive testing would be avoided for everyone in the 10-15% of the adult pharyngitis population that falls into this group.
- Testing all intermediate probability adults will assure appropriate treatment for the 55% of the population that falls into this group. The substantial minority with GABHS will be appropriately treated and the majority will not be over treated with antibiotics.
- If all low probability adults are not tested and not treated, about 1% of the population would have GABHS and would not be treated. However, expensive testing would be avoided for everyone in the 30% of the adult pharyngitis population that falls into this group. If a physician elects to perform a rapid strep test on a low risk patient and the result is negative, only 0.3% of those patients would have GABHS. Confirming cultures would not be necessary.

In contrast, IDSA does not recommend clinical scoring systems. IDSA does however, recommend classifying patients into two groups based on the likelihood of GABHS pharyngitis versus viral infection or other etiology. To favor the diagnosis of GABHS pharyngitis, IDSA considers suggestive clinical findings, such as sudden onset of sore throat, pain on swallowing, and fever, as well as epidemiological features, such as age (5-15 years old), seasonal occurrence, and exposure to GABHS. IDSA discusses symptom profiles that are more consistent with viral infection than GABHS infection, such as cough and nasal congestion. IDSA also concludes laboratory testing and antimicrobial therapy are not indicated if the diagnosis can be confidently excluded on clinical and epidemiological grounds. For all other patients with possible GABHS pharyngitis, laboratory testing is recommended to determine appropriateness of antibiotic therapy.

Treatment Decisions

UMHS recommends immediate treatment of high probability cases without laboratory testing, but allows for limited testing in this group in special circumstances, such as to document index cases so that close contacts may be treated more rapidly, in the event of failure of standard therapy, or to avoid a potential antibiotic reaction. In direct contrast to UMHS, IDSA discourages empiric treatment in the absence of laboratory confirmation and recommend antimicrobial therapy only for those with a positive rapid strep test or throat culture result.

IDSA allows for initiation of antimicrobial therapy for cases with a high index of suspicion; however, a laboratory test is still recommended so that therapy may be discontinued if the diagnosis of streptococcal pharyngitis is not confirmed. IDSA and UMHS recommend against laboratory testing and antibiotic treatment for adults who are unlikely to have GABHS pharyngitis. UMHS uses a clinical scoring system to identify this low probability group; whereas, IDSA more subjectively consider the spectrum of clinical and epidemiologic features that suggest a viral rather than a streptococcal etiology.

ACP recommends analgesics, antipyretics, and other supportive care for all patients with pharyngitis. Recommendations are made for antibiotic therapy limited to those patients most likely to have GABHS pharyngitis. Although ACP does not recommend one strategy to determine that likelihood, they offer two strategies to guide treatment decisions: (1) Empirical antibiotic treatment of adults with at least three of four clinical criteria (history of fever, tonsillar exudates, tender anterior cervical lymphadenopathy, and absence of cough) and non-treatment of all others; or (2) Empirical treatment of adults with all four clinical criteria, rapid antigen testing of patients with three (or perhaps two) clinical criteria, and treatment of those with positive test results and non treatment of all others. Finally, this group recommends penicillin, or erythromycin in penicillin-allergic patients, as first-line therapy for acute GABHS pharyngitis.

Although the assessment of the likelihood of GABHS pharyngitis differs among the organizations, the general management strategies of these four organizations can be summarized in the following Table:

<table>
<tr><td></td><td colspan="3">Likelihood of GABHS Pharyngitis, as Defined in Each Guideline</td></tr>
<tr><td></td><td>High</td><td>Intermediate</td><td>Low</td></tr>
<tr><td rowspan="3">ACP</td><td colspan="2">Empirical treatment without laboratory testing of adults with at least 3 of 4 clinical criteria (fever, tonsillar exudate, lymphadenopathy, absent cough)</td><td>No laboratory testing and no antimicrobial treatment</td></tr>
<tr><td colspan="3">OR</td></tr>
<tr><td>Empirical treatment of adults with all four clinical criteria</td><td>RADT of patients with 2 or 3 of 4 clinical criteria; Treat those with a positive test, nontreatment of others</td><td>No laboratory testing and no antimicrobial treatment</td></tr>
<tr><td>IDSA</td><td colspan="2">Laboratory testing (RADT or throat culture) of patients with clinical findings and epidemiological features suggestive of GABHS
Antimicrobial treatment of laboratory confirmed cases</td><td>No laboratory testing and no antimicrobial treatment</td></tr>
<tr><td>UMHS</td><td>Based on clinical</td><td>Laboratory testing (RADT or</td><td>No laboratory</td></tr>
</table>

	Likelihood of GABHS Pharyngitis, as Defined in Each Guideline		
	High	Intermediate	Low
	scoring system, empiric antibiotic treatment without laboratory testing in most cases	throat culture), negative RADTs require confirmation with throat culture; Treat those with a positive test	testing and no antimicrobial treatment

In conclusion, IDSA and UMHS strive to balance laboratory utilization and antibiotic usage through different means. UMHS eliminates laboratory testing for patients with a high probability of GABHS pharyngitis, favoring empiric antibiotic treatment for this group and limiting laboratory testing to those adults in the intermediate probability category. With IDSA's strategy, more laboratory tests will be performed than with UMHS' approach, because IDSA calls for testing patients characterized as high probability as well as those in the intermediate category in UMHS' scheme. However, because clinical suspicion is always followed-up with a laboratory test with IDSA's approach, fewer patients will be inappropriately treated with antibiotics. Each strategy involves a tradeoff between the expense of performing additional laboratory tests versus the risk of over-treating a proportion of patients with antibiotics. Because laboratory utilization and diagnostic strategies are not the focus of their guideline, ACP offers treatment recommendations only. All the guidelines target antimicrobial treatment to those most likely to have GABHS pharyngitis and aim to decrease excessive antibiotic use.

Choice of Antibiotics For Children

IDSA and UMHS's stance on the use of broader spectrum penicillin congeners (i.e., amoxicillin) for children differs. UMHS recommends amoxicillin rather than penicillin for children with GABHS pharyngitis, despite its higher cost, because the drug may have higher compliance due to its better taste. Although IDSA recommends penicillin as first-line treatment for children, they note with a neutral tone that amoxicillin is often used in place of oral penicillin V in young children, and this choice is primarily related to acceptance of the taste of the suspension. The efficacy of amoxicillin, IDSA comments, appears to be equal to that of penicillin V. ICSI acknowledges that the broader spectrum penicillins are often used for treatment of GABHS in children, however, they conclude that amoxicillin and ampicillin offer no microbiologic advantage over penicillin. ACP does not address a pediatric population.

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